

# Bronchial asthma at high altitude: a clinical and laboratory study in Addis Ababa

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**ABSTRACT** In a study designed to throw light on the natural history of asthma in Ethiopia, 91 patients living at 2500 metres and attending asthma clinics in Addis Ababa underwent spirometric and skinprick testing. Only eight had had symptoms of asthma before the age of 16. Sixty two had a history of allergic rhinitis and 16 had a family history of allergic rhinitis; 33 had a family history of asthma. In 30 cases asthma was worse from August to October. All patients had tried traditional remedies, usually without success; and all took modern drugs, oral combination bronchodilators being the most frequently used.

## Introduction

Bronchial asthma is no longer rare in tropical and subtropical Africa,<sup>1,2</sup> including Ethiopia.<sup>3-5</sup> As relatively little is known about the natural history of asthma in Africa we have studied asthma in Ethiopians in Addis Ababa (altitude 2500 metres), looking at age of onset, family history, spirometric values, responses to skin tests for allergy, and traditional forms of treatment. Addis Ababa has a dry (October-May) and a rainy (June-September) season. The period of study was August to October as previous reports indicated an increase in cases of asthma during this period.<sup>2,4</sup>

## Methods

Asthmatic patients seen at three clinics for adults in Addis Ababa were studied on the basis of a specially designed questionnaire. A clinical diagnosis of asthma was based on a convincing history of recurrent episodes of cough, wheezing, and shortness of breath. Because of the nature of the clinics, the sample was biased towards bank workers and hospital staff.

Skinprick tests were performed with Bencard solutions. The antigenic materials (selected on the basis of previous experience in Ethiopian patients) were cat fur, dog hair, horse hair, feathers, cotton flock, house

dust, and house dust mite. Atopy was diagnosed by the presence of a weal of 3 mm or more diameter excluding pseudopodia. Spirometry was carried out in 40 patients with a dry wedge spirometer (Vitalograph) before and after two puffs of isoprenaline.

## Results

The age and sex distribution of 91 asthmatic patients and the age of onset of asthma are shown in table 1. There were three smokers, all male. Asthma had started before the age of 16 in eight patients only, and in five it had developed after the age of 45. Asthma was perennial in two thirds of the patients (60) and worse from August to October in one third (31). Two thirds of the patients (62) had allergic rhinitis. There was a family history of allergic rhinitis in 16 cases and of asthma in 33 subjects.

In the 40 patients undergoing spirometry FEV<sub>1</sub> was above 70% of the predicted value in 14, 50-70% in 14, 30-50% in nine, and below 30% in three. After isoprenaline 16 patients showed no change or less than 5% increase in FEV<sub>1</sub>, seven showed a 5-15% improvement, and 17 an increase of more than 15%. Positive skin test responses were seen with cotton flock (12/77) and most frequently with house dust mite (54/77). Table 2 shows the precipitating factors considered to be important by the patients. Two women, including a nurse, had avoided pregnancy so that their asthma would not be aggravated.

The two most popular traditional treatments for asthma were the ingestion of raw beaten eggs and pure honey in the morning. Other treatment included the consumption of ostrich eggs, smoking dry excreta of

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Table 1 Age and sex distribution of 91 patients with asthma (numbers whose asthma started in each age range shown in parentheses)

Age (y):	≤5	6-15	16-25	26-35	36-45	46-55	>55
Male	0 (1)	2 (3)	2 (11)	16 (15)	12 (9)	7 (3)	3 (0)
Female	0 (2)	1 (2)	3 (27)	32 (13)	6 (3)	5 (2)	2 (0)
Total	0 (3)	3 (5)	5 (38)	48 (28)	18 (12)	12 (5)	5 (0)

the elephant, and drinking ox bile. Two nurses drank their urine but experienced no improvement. Acupuncture and numerous unidentified herbal medications were tried by many but usually in vain. All patients took modern drugs simultaneously or on different occasions, 28 of the 91 taking more than one drug. Oral combination bronchodilators containing theophylline, ephedrine, and phenobarbitone (Fanol, Tedral) were used most frequently (in 64 cases), though 23 patients used salbutamol inhalers and 30 were taking corticosteroids in the form of tablets (22), inhalers (2), or depot injection (6).

Table 2 Precipitating factors of asthma noted by patients

	Yes	No	Don't know or uncertain
Upper respiratory infection	59	12	20
Dust	69	15	7
Exercise	45	18	28
Cold weather	51	8	32
Weather changes	35	10	46
Diet	8	12	71
Aspirin	5	32	54
Psychological factors	41	13	37
Odour	35	3	53
Alcohol	17	19	55
Flowers	34	11	46
Pets	15	11	65
Pregnancy	6	13	0

## Discussion

Although the study is biased in terms of the demography of the patients, this should have little effect on the reported age of onset of asthma. Asthma started before the age of 16 in only eight of the 91 patients, one of the lowest proportions reported from either Africa or Europe.<sup>16</sup> Oglivie<sup>7</sup> reported that among 1000 asthmatic patients in the UK the morbidity and mortality from asthma was much worse in those whose asthma

started after the age of 16. Whether this is also true of the Ethiopians remains to be seen.

A past history of allergic rhinitis was obtained from 62 (68%) of the patients and a family history of allergic rhinitis from 16 (18%) and of asthma from 33 (36%). The corresponding figures in Nigerian patients in Zaire were 27% and 25%.<sup>1</sup> A family history of asthma was reported by 50% of asthmatic subjects in Ghana<sup>8</sup> and by 35% in England.<sup>6</sup>

All patients have tried some form of traditional medicine but usually in vain. Folklore medicine is so deeply rooted in the society that two patients from the medical profession drank their own urine. Many patients combined traditional forms of treatment with modern therapeutic agents. Unfortunately some of the more effective treatments, such as inhaled bronchodilators, are very expensive in Ethiopia.

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